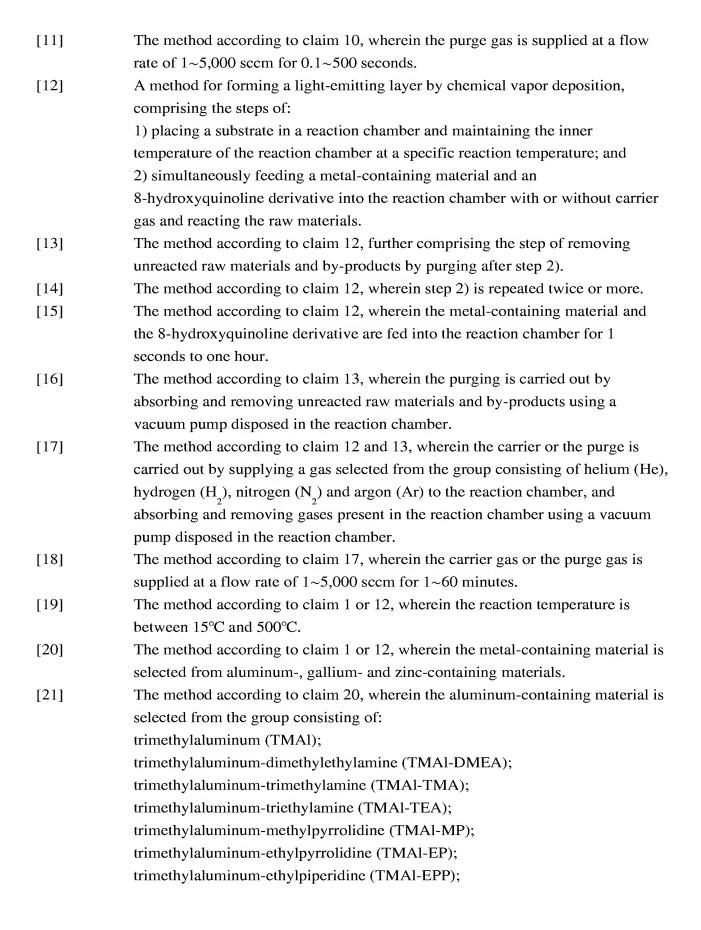
16

WO 2005/112084 PCT/KR2005/001444

Claims

- [1] A method for forming a light-emitting layer by atomic or molecular layer deposition, comprising the steps of: 1) placing a substrate in a reaction chamber and maintaining the inner temperature of the reaction chamber at a specific reaction temperature; 2) feeding a metal-containing material into the reaction chamber and reacting the material with the substrate; and 3) feeding an 8-hydroxyquinoline derivative into the reaction chamber and reacting the raw materials. [2] The method according to claim 1, further comprising the step of removing unreacted raw materials and by-products by first purging after step 2) and prior to step 3). The method according to claim 1, further comprising the step of removing [3] unreacted raw materials and by-products by second purging after step 3). [4] The method according to claim 1, wherein steps 2) and 3) are repeated twice or more. [5] The method according to claim 1, wherein the metal-containing material and the 8-hydroxyquinoline derivative are fed into the reaction chamber for 0.1~500 seconds. [6] The method according to claim 2, wherein the first purging is carried out by absorbing and removing unreacted raw materials and by-products using a vacuum pump disposed in the reaction chamber. [7] The method according to claim 2, wherein the first purging is carried out by supplying a purge gas selected from the group consisting of helium (He), hydrogen (H₂), nitrogen (N₂) and argon (Ar) to the reaction chamber, and absorbing and removing gases present in the reaction chamber using a vacuum pump disposed in the reaction chamber. [8] The method according to claim 7, wherein the purge gas is supplied at a flow rate of $1\sim5,000$ sccm for $0.1\sim500$ seconds. [9] The method according to claim 3, wherein the second purging is carried out by absorbing and removing unreacted raw materials and by-products using a vacuum pump disposed in the reaction chamber.
- [10] The method according to claim 3, wherein the second purging is carried out by supplying a purge gas selected from the group consisting of helium (He), hydrogen (H_2), nitrogen (N_2) and argon (Ar) to the reaction chamber, and absorbing and removing gases present in the reaction chamber using a vacuum pump disposed in the reaction chamber.

WO 2005/112084 PCT/KR2005/001444



WO 2005/112084 PCT/KR2005/001444

trimethylaluminum-ethylmorpholine (TMAl-EMP); triethylaluminum (TEAl); triethylaluminum-dimethylethylamine (TEAl-DMEA); triethylaluminum-trimethylamine (TEAl-TMA); triethylaluminum-triethylamine (TEAl-TEA); triethylaluminum-methylpyrrolidine (TEAl-MP); triethylaluminum-ethylpyrrolidine (TEAl-EP); triethylaluminum-ethylpiperidine (TEAl-EPP); and triethylaluminum-ethylmorpholine (TEAl-EMP). [22] The method according to claim 20, wherein the aluminum-containing material is selected from the compounds listed in Table 1. [23] The method according to claim 20, wherein the gallium-containing material is selected from the compounds listed in Table 2. [24] The method according to claim 20, wherein the zinc-containing material is selected from the compounds listed in Table 3. [25] The method according to claim 1 or 12, wherein the 8-hydroxyquinoline derivative is selected from the compounds listed in Figure 4. [26] The method according to claim 1 or 12, wherein the metal-containing material and the 8-hydroxyquinoline derivative are vaporized before being fed into the reaction chamber.